Section 2.0 Description of Alternatives

2.1 Alternative Resource Management Plans

The primary goal is to incorporate new management direction that integrates fire and fuels management with other management activities to benefit both natural resources and multiple-uses on BLM-administered public lands throughout Arizona. Table 2.1 compares the average annual level of fire management activity under the Proposed Action and the No Action Alternative.

2.2 Proposed Action

The proposed action is to amend BLM's seven existing Land Use Plans (LUPs) to update the plans to comply with current fire policy and guidance and to fully integrate fire and fuels management and direction found in the latest DOI and BLM resource program guidance for lands administered by BLM. The LUP Amendment would establish **Desired Future Conditions, Land Use Allocations,** and **Management Actions,** and would amend existing LUP decisions concerning fire, fuels and air quality management. The LUP Amendment would include use of fire and other vegetative treatments as tools to achieve resource management objectives. Fire management in the amended LUPs would also include adaptive management for wildfire; allow fire to resume a more natural ecological role within each ecosystem; the use of prescribed fire; and mechanical, chemical or biological treatments to meet resource objectives and reduce hazardous fuels on public lands inside and outside Wildland-Urban Interface (WUI) areas.

The objective of the proposed action is to manage fire and fuels according to the current policies and requirements (as discussed in Sections 1.1.1. and 1.3) and to meet desired future conditions for those and other resources. Fire management objectives would be developed and coordinated with resource management objectives. The utilization of prescribed fire, mechanical, biological, and chemical fuels treatments combined with fire suppression and rehabilitation would be the tools fire management would use to achieve the resource objectives.

2.2.1 Desired Future Conditions

The Proposed Action would establish the following Desired Future Conditions:

- Fire is recognized as a natural process in fire-adapted ecosystems and is used to achieve objectives for other resources;
- Where conditions are suitable, fire is used to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires and meet resource objectives;
- Where fuel loading is high but conditions are not suitable for fire, fuel loads are reduced to meet resource objectives;
- Fuels in WUI areas are maintained at non-hazardous levels to provide for public and fire fighter safety;
- BLM-administered public lands are assigned to one of four fire management categories (A-D polygons), which are updated in Fire Management Plans;
- Prescribed fire activities comply with Federal and State air quality regulations; and
- Each vegetation community is maintained within its natural range of variation in plant composition, structure, and function, and fuel loads are maintained below levels that are considered to be hazardous (see bold text in **Appendix C** for the description of the desired future condition for each vegetation community).

2.2.2 Land Use Allocations

Under the Proposed Action, BLM-administered public lands would be assigned to one of the following four fire management categories:

Category A: ***Areas where fire is not desired at all.*** This category includes areas where mitigation and suppression are required to prevent direct threats to life or property. It also includes areas where fire never played a large role historically in the development and maintenance of the ecosystem, and some areas where fire return intervals were very long

Category B: ***Areas where unplanned wildfire is not desired because of current conditions.*** These are ecosystems (including some WUI areas) where an unplanned ignition could have negative effects unless/until some form of mitigation takes place.

Category C: ***Areas where wildland fire is desired, but there are significant constraints that must be considered for its use.*** Areas where significant ecological, social or political constraints (such as air quality, threatened and endangered species, or wildlife habitat considerations) limit wildland fire.

Category D: ***Areas where wildland fire is desired, and there are few or no constraints for its use.*** Areas where unplanned and planned wildfire may be used to achieve desired objectives such as to improve vegetation, wildlife habitat or watershed conditions.

Allocation of lands into a category would be based upon adoptive management techniques based on ecological conditions and ecological risks, and are determined by contrasting current with historical conditions and ecological risks associated with those changes. The condition class concept helps describe alterations in key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. An interdisciplinary team of resource and fire management specialists would evaluate and place lands into specific categories. This process may include meetings with the public and fire cooperators. Table 2.3 lists current Fire Management Zone Categories for each field office. Since category designations change over time as fuel loads or vegetation conditions change and resource objectives are met, determinations of when lands match the criteria to be placed in category A, B, C or D would be made and regularly revised in BLM Fire Management Plans[1]. The Fire Management Plans will also detail specific areas for exclusion from fire, chemical, mechanical, and/or biological treatments. Under the Proposed Action, it is anticipated that the percentage of lands in category A will decrease and the percentage of lands in category D will increase.

[1] BLM's fire management program in Arizona is divided into four fire zones, each with its own fire staff and fire management plan. The four zones are: Arizona Strip (ASFZ), Phoenix/Kingman (PKFZ), Safford/Tucson (STFZ), and Yuma/Lake Havasu (YHFZ). The ASFZ and the YHFZ are interagency in organizational makeup. The ASFZ is combined with the Dixie National Forest, Pine Valley Ranger District. The YHFZ is combined with the Bureau of Indian Affairs, Colorado and Fort Yuma Agencies. The STFZ and PKFZ are BLM zones only.

2.2.3 Management Actions

In Category A areas, BLM will implement programs to reduce unwanted ignitions, and emphasize prevention, detection, and rapid suppression response techniques.

In Category A areas where fuel loading is high, BLM will utilize biological, mechanical or chemical treatments (but not fire) to maintain non-hazardous levels of fuels and meet resource objectives

In Category B and C areas where fuel loading is high and conditions are not suitable for fire, BLM will emphasize prevention and mitigation programs to reduce unwanted fire ignitions, and use mechanical, biological or chemical treatments to mitigate the fuel loadings and meet resource objectives.

In Category B and C areas where conditions may be suitable for fire, BLM will utilize prescribed fire and a combination of biological, mechanical and chemical treatments to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires and meet resource objectives.

In Category C areas where conditions are suitable for fire, BLM will emphasize prescribed fire and allow naturally ignited wildland fire to achieve resource conditions.

In Category D areas, BLM will minimize fire suppression activities, and minimize biological, mechanical, and chemical fuel treatments.

In Category D areas, BLM will emphasize prescribed fire and naturally ignited fires to achieve resource objectives.

In Category B, C and D areas, BLM will monitor existing air quality levels and weather conditions to determine which prescribed fires can be ignited and which, if any, must be delayed to ensure that air quality meets federal and state standards. If air quality approaches unhealthy levels BLM will delay igniting prescribed fires.

In addition to establishing Category areas (A-D), to reduce human caused fires BLM will undertake education, enforcement and administrative fire prevention mitigation measures. Education measures will include various media information including a signing program, information as to the natural role of fire within local ecosystems, participation in fairs, parades and public contacts. Enforcement will be accomplished by providing training opportunities for employees interested in fire cause determination. Administration includes expanded prevention and education programs with other cooperator agencies.

Table 2.1 – Comparison Of Anticipated Average Annual Levels Of Activity

Action/Treatment	No Action Alternative	Proposed Action Alternative
Wildland fires	Between the years1993–2000 there were 995 fires that burned 179,550 acres.	Similar to No Action Alternative in the short term, acres burned and intensity of fires would gradually decrease as hazardous fuel loads are reduced. The number of fires and acres burned, and cost of suppression should decrease in areas treated.
Acres of rehabilitation	Unknown, but related to the number of acres burned by wildfire	Same as No Action Alternative in the short term, eventually the number of emergency acres treated should be less than with No Action Alternative since wildfire on treated areas should require less rehabilitation. However, the number of strategically rehabilitated acres may increase in the future with the increased use of prescribed fire.
Prescribed fires	Between the years 1990–2003 there were 46,448 acres treated with prescribed fire for an average of 3,317 per year.	In 2004 there are 9,930 acres planned for prescribed fire. The number of acres treated in future years should increase compared to the No Action Alternative. Acreage limitations on the use of prescribed fire would be removed.
Projects with an objective to reduce fuels near interface areas	During the years 1990–2001 there were 6 projects to reduce fuels in the WUI. Between 2002–2003, there were 27 projects to reduce fuels in the WUI	The number of projects and acres treated would increase dramatically in 2004 and beyond. In FY 2001, 121 priority interface areas[2] with hazardous fuels were identified.
Mechanical, biological, or chemical projects with an objective to reduce hazardous fuels	In the years 1990–2003 there were 20,360 acres treated. An average of 1,454 per year.	There are 12,277 acres planned for treatment in 2004. The number of projects and acres treated would increase dramatically in future years.
Projects to meet other resource objective	0	The number of projects and acres treated would increase

For all fire management activities (wildfire suppression, adaptively managed wildfire, prescribed fire, and mechanical, chemical, and biological vegetation treatments), Conservation Measures will be implemented as part of the Proposed Action to provide statewide consistency in reducing the effects of fire management actions on Federally threatened, endangered, proposed, and candidate ("Federally protected") species (**Appendix D**). Conservation Measures noted as "Recommended" are discretionary for implementation, but are recommended to help minimize effects to Federally protected species.

[2] 66 FR 43384, Department of Agriculture and Department of Interior, *Urban Wildland Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire;* Federal Register Notice, August 17, 2001.

Procedures within the Interagency Standards for Fire and Fire Aviation Operations 2003, including future updates, relevant to fire operations that may affect Federally protected species or their habitat are incorporated here by reference.[3]

Firefighter and public safety is the first priority in every fire management activity. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources must be based on the values to be protected, human health and safety, and costs of protection (2001 Federal Wildland Fire Management Policy). However, implementing the following Conservation Measures during fire suppression to the extent possible, and during the proposed fire management activities as required, would minimize or eliminate the effects to Federally protected species and habitats.

During fire suppression actions, Resource Advisors will be designated to coordinate concerns regarding Federally protected species, and to serve as a liaison between the Field Office Manager and the Incident Commander/Incident Management Team. They will also serve as a field contact representative (FCR) responsible for coordination with the USFWS. The Resource Advisors will have the necessary information on Federally protected species and habitats in the area and the available Conservation Measures for the species. They will be briefed on the intended suppression actions for the fire, and will provide input on which Conservation Measures are appropriate, within the standard constraints of safety and operational procedures. The Incident Commander has the final decision-making authority on implementation of Conservation Measures during fire suppression operations.

Because of the number of species located within the action area for proposed Statewide LUP Amendment, combined with a variety of fire suppression and proposed fire management activities, conflicts may occur in attempting to implement all Conservation Measures for every species potentially affected by a particular activity. Implementing these Conservation Measures effectively would depend on the number of Federally protected species and their individual life history or habitat requirements within a particular location that is being affected by either fire suppression or a proposed fire management activity. This would be particularly true for timing restrictions on fuels treatment activities, if the ranges of several species with differing restrictions overlap, making effective implementation of the activity unachievable. Resource Advisors (in coordination with the USFWS), Fire Management Officers or Incident Commanders, and other resource specialists would need to coordinate to determine which Conservation Measures would be implemented during a particular activity. If Conservation Measures for a species cannot be implemented, BLM would be required to initiate Section 7 consultation with the USFWS for that particular activity.

BLM will update their local Fire Management Plans to include site-specific actions for managing wildfire and fuels in accordance with the new Federal fire policies, based on guidance provided in the Decision Records for this Statewide LUP Amendment. These plans will be coordinated with the USFWS and the Arizona Game and Fish Department (AGFD) to address site-specific concerns for Federally protected species. These plans will incorporate the Conservation Measures included in this Statewide LUP Amendment for Federally protected species occurring within each Fire Management Zone. Consultation with the USFWS will occur with these project-level plans, as necessary.

2.3 No Action Alternative

Under the No Action Alternative, the LUPs would not be amended and existing fire management direction would be continued as described in Table 2.3. Existing fire management direction is for BLM to aggressively suppress fires to protect other resources in areas without approved Fire Management Plans or in areas with Fire Management Plans that are not consistent with the 2001 Federal Fire Policy. Table 2.2 lists current Fire Management categories for each Field Office. No FO has any lands designated as Category D, "Areas where wildland fire is desired, and there are few or no constraints for its use." Under the No Action Alternative, fire would not be consistently managed by BLM across Arizona.

2.4 Management Common to all Alternatives

There are several treatment methods and Standard Operating Procedures that would be used in a vegetation treatment program. BLM policies and guidance for public land treatments would be followed in implementing all treatment methods. Many guidelines are provided in manual Section

[3] BLM, NPS, USFWS, USFS. 2003. *Interagency Standards for Fire and Fire Aviation Operations 2003*. These standards can be found at: www.fire.blm.gov/Standards/redbook.htm (*Note:* This document is updated annually. For BLM, this document is Handbook 9213-1).

Table 2.2 – Current Fire Management Zone Categories

Field Office	Category	Number of Fire Management Polygons	Approximate Acres	Percent
Arizona Strip	A	4	626,850	23%
	B	2	34,880	1%
	C	6	2,099,550	76%
	D	0	0	0%
Kingman	A	1	2,056,660	84%
	B	1	98,540	4%
	C	2	301,840	12%
	D	0	0	0%
Lake Havasu	A	5	1,325,150	99%
	B	0	0	0%
	C	0	0	0%
	D	0	0	0%
	Unclassified	1	13,060	1%
Phoenix	A		2,306,840	94%
	B	1	56,950	2%
	C	1	84,200	3%
	D	0	0	0%
	Unclassified	1	160	<.01%
Safford	A	2	223,470	14%
	B	2	97,310	6%
	C	2	163,120	10%
	B, C[1]	2	152,500	10%
	A, B, D[1]	1	916,330	59%
	D	0	0	0%
	Unclassified	1	6,670	0.4%
Tucson	A	1	320,550	52%
	B	1	130,790	21%
	B, C[1]	2	131,990	22%
	C, D[1]	1	27,510	5%
	C	0	0	0%
	D	0	0	0%
Yuma	A	7	1,342,770	100%
	B	0	0	0%
	C	0	0	0%
	D	0	0	0%
Total	Not Applicable	47	12,517,690	Not Applicable

[1] Multiple categories denote a fire management polygon that contains land with a different category within it.

Table 2.3 –Existing LUP Decisions

KINGMAN RMP		
Resource Area	**Decision Number**	**Decision**
Fire Management	FM01/C2	Implement and propose revision of the Phoenix District Fire Management Activity Plan to meet specific Kingman Resource Area needs
	FM02/C2	Use prescribed fire to achieve management objectives where suitable
	FM03/C3	Adhere to conditions that restrict or constrain fire suppression activities on public lands.
	FM04/C3	Prepare site specific emergency fire rehabilitation plans, as needed, using an interdisciplinary team.
Vegetative Products Management	VP01/B2	Develop Fuelwood Management Plan
Watershed Management	WS06/C2	Identify areas for potential vegetation treatment
YUMA RMP		
Fire Management	F-1	Fires on or threatening public lands will be suppressed in accordance with BLM fire policy, initial attack agreements with other government agencies, and approved modified fire suppression plans.
	F-2	Prescribed burning will continue to be used in support of resource management objectives where warranted.
Vegetation Management	V-2	Whenever practical, impacts to vegetation from construction, recreation, and other activities will be mitigated through avoidance, use of the minimum reasonable and practical tools and equipment, minimizing disturbance to the extent practical, and by soil stabilization and vegetative rehabilitation or revegetation where feasible. Where plants and parts of plants will be destroyed as an unavoidable impact, reasonable efforts will be made to salvage useable plants and parts of plants for commercial or public use.
Resource Area	**Decision Number**	**Decision**
SAFFORD RMP		
Vegetation Management	VM02	Upland vegetation on public lands within the Safford District will be managed for watershed protection, livestock use, reduction of non-point source pollution, Threatened and Endangered species protection, priority wildlife habitat, firewood and other incidental human uses. Best management practices and vegetation manipulation will be used to achieve desired plant community management objectives. Treatments may include various mechanical, chemical and prescribed fire methods.
	VM07	Land treatments (vegetation manipulation) will be used to decrease invading woody plants and increase grasses and forbes for wildlife, watershed condition, and livestock. Treatment areas will be identified in activity plans. Treatments may include various artificial (mechanical, chemical, or prescribed fire) methods.
	VM08	The following actions will be implemented to accomplish the land treatment objective. a) Implement those best management practices and methods that will increase vegetation cover and decrease soil erosion and non-point source pollution to streams from sedimentation. b) Study the methods and effects of reducing rodent and rabbit populations on selected upland areas to improve vegetation cover.
	VM10	Evaluate other areas suitable for firewood harvest. Permit the harvest of up to 500 cords of firewood per year from public lands Districtwide. Do not allow cutting in major desert washes, wilderness areas, or some special management areas.
	VM114	Land treatments such as imprinting and seeding, chaining or fire could be implemented on approximately 75,000 acres to enhance rangeland values, watershed conditions, and wildlife habitat.
Wildlife/Fisheries	WF17	Develop prescribed burning plans in fire-dependent vegetation communities to improve habitat conditions for priority wildlife species.
	WF18	Suppress wildfire in sensitive vegetation communities (like paloverde/saguaro) to reduce the detrimental effects on priority wildlife dependent on those communities.
Watershed	WS36	Conduct prescribed fire with prior approval of the Arizona Department of Environmental Quality, Office of Air Quality.

PHOENIX RMP		
Fire Management	A	Maintain full fire suppression in all areas.
	B	Special Management Area plans will identify areas where prescribed burning would benefit wildlife, watershed and rangeland resources.
Eastern Arizona Grazing EIS		Land treatments such as imprinting and seeding, chaining or fire could be implemented to enhance rangeland values, watershed conditions, and wildlife habitat.
ARIZONA STRIP RMP		
Fire Management		Full suppression activities will be initiated in the four desert ACECs. BLM will suppress wildfires with minimum surface disturbance, in accordance with the guidelines in Duck et al (1994) and appropriate biological opinions.
		BLM will pre-position suppression forces in critical areas during periods of high fire danger.
		BLM will require a resource advisor on all wildfires in tortoise ACECs. Firefighters and support personnel will be provided with a briefing on tortoises and their habitat as soon as practical, which will focus on minimizing take of listed species, particularly take due to vehicle use. On-road travel will be restricted to the minimum necessary to suppress wildfires. Whenever practicable, individuals trained to recognize tortoises and their shelter sites will precede any vehicle traveling off-road. Use of tracked vehicles will be restricted to extreme cases. Camps, staging areas, and helispots will be surveyed for tortoises prior to use whenever feasible; camps will be established within previously disturbed areas whenever practicable; personnel will avoid active tortoise shelter sites.
Resource Area	**Decision Number**	**Decision**
		BLM will obliterate tracks where they leave roads to reduce future use.
		Use of foam or retardant is authorized.
		BLM will take appropriate action to suppress all wildfires based on pre-planned analysis consistent with land management objectives, including threats to life and property. Backfiring operations will be permitted where necessary. Burning-out of unburned fingers and islands will not be permitted.
Forest and Woodland	FW08	Protect forests from catastrophic fires while managing prescribed burns or naturally occurring fires within established prescriptions to reduce fuel buildup, maintain healthy species composition and benefit wildlife habitat, watershed cover and livestock forage.
Grazing Management	GZ06	Continue implementing the grazing management program as described in the Grazing Environmental Impact Statements that specify grazing systems, management facilities and land treatments, provided they are consistent with other RMP decisions. Practices used to accomplish this include mechanical treatment, herbicide applications, biological treatments, prescribed fire, reseeding and construction of water control structures. Use of pesticides are prescribed, as appropriate to control insects, such as grasshoppers, crickets, etc.
LOWER GILA SOUTH RMP		
None		
LOWER GILA NORTH MFP		
	D-11	By 1987, develop fire management plans that coincide with established resource objectives to include protection from wildfire, introduction of prescribed fire and modification of normal suppression actions.
	D-16	Develop a fire management program in coordination with the rangeland management program that would include identification of modified suppression areas, intensive control areas, and areas where controlled burning would be beneficial.
	D-17	Develop a fire management program to protect riparian habitat from fire within all of the significant botanical areas.

1740, BLM Arizona's Standards for Rangeland Health, Programmatic documents such as BLM's *Environmental Impact Statement for Vegetation Treatments, Watersheds and Wildlife Habitats on Public Lands Administered by the BLM in the Western United States, Including Alaska (May 1991),* and other general and specific program policy, procedures, and standards pertinent to implementation of renewable resource improvements. The following manual, chemical, mechanical, biological and fire treatment methods would be used for all alternatives.

Manual

Hand-operated power tools and hand tools are used in manual vegetation treatment to cut, clear, or prune herbaceous and woody species. In manual treatments, workers would cut plants above ground level; pull, grub, or dig out plant root systems to prevent subsequent sprouting and regrowth; scalp at ground level or remove competing plants around desired vegetation; or place mulch around desired vegetation to limit the growth of competing vegetation. Hand tools such as the handsaw, axe, shovel, rake, machete, grubbing hoe, mattock (combination of axe and grubbing hoe), brush hook, and hand clippers are used in manual treatments. Axes, shovels, grubbing hoes, and mattocks can dig up and cut below the surface to remove the main root of plants such as prickly pear and mesquite that have roots that can quickly resprout in response to surface cutting or clearing. Workers also may use power tools such as chain saws and power brush saws.

Although the manual method of vegetation treatment is labor intensive and costly, compared to prescribed burning or herbicide application, it can be extremely species selective and can be used in areas of sensitive habitats or areas that are inaccessible to ground vehicles. Manual treatment of undesired plants would be used on sites designated as categories a, b, or c, where fire (prescribed or naturally ignited) is undesirable or where significant constraints prevent widespread use of fire as a management tool. These sites comprise a range of vegetation communities or habitat types, and include areas where there may be wildlife concerns, yet it is deemed beneficial to remove trees, shrubs, or other fuel loading vegetation. Manual vegetation treatments cause less ground disturbance and generally remove fewer amounts of vegetation than is associated with other treatment methods (prescribed fire or mechanical treatments).

Mechanical

Mechanical methods of vegetation treatment employ several different types of equipment to suppress, inhibit, or control herbaceous and woody vegetation (Vallentine 1980). The goal of mechanical treatments is to kill or reduce the cover of undesirable vegetation and thus encourage the growth of desirable plants. BLM uses wheel tractors, crawler-type tractors, mowers, or specially designed vehicles with attached implements for mechanical vegetation treatments. The use of mechanical equipment to reduce fuel hazards will be conducted in accordance with BLM established procedures. Re-seeding after a mechanical treatment has been applied is important to help insure that desirable plants will become established on the site and not weedy species. The mechanical treatment and reseeding should occur at a time to best control the undesirable vegetation and encourage the establishment of desirable vegetation. The best mechanical method for treating undesired plants in a particular location depends on the following factors:

(1) Characteristics of the undesired species present such as plant density stem size, woodiness, brittleness, and re-sprouting ability;

(2) Need for seedbed preparation, re-vegetation, and improve water infiltration rates;

(3) Topography and terrain;

(4) Soil characteristics such as type, depth, amount and size of rocks, erosion potential, and susceptibility to compaction;

(5) Climatic and seasonal conditions;

(6) Potential cost of improvement as compared to expected results.

Bulldozing consists of a wheeled or crawler tractor with a heavy hydraulic controlled blade. Vegetation is pushed over and uprooted and then left in windrows or piles. Bulldozing is best adapted to removing scattered stands of large brush or trees. There are several different kinds of blades available depending of the type of vegetation and goals of the project. The disadvantage of bulldozing is soil disturbance and damage to non-target plant species.

Disk plowing in it various forms can be used for removing shallow-rooted herbaceous and woody plants. Disk plows should only be used where all of the vegetation is intended to be killed. There are several different kinds of root plows that are specific for certain types of vegetation. In addition to killing vegetation, disk plowing is effective in loosening the

soil surface to prepare it for seeding and to improve the rate of water infiltration. The disadvantage of disk plowing is that it may be expensive and usually kills all species. Also, plowing is usually not practicable on steep slopes (greater than a 35% to 45% slope) or rocky soil. Plant species that sprout from roots may survive.

Chaining and cabling is accomplished by dragging heavy anchor chains or steel cables hooked behind to tractors in a U-shape, half circle of J-shaped manner. Chaining and cabling is affective on rocky soils and steep slopes. Chaining and cabling are best used to control non-sprouting woody vegetation such as small trees and shrubs. However, desirable shrubs may be damaged in the process. Herbaceous vegetation is normally not injured by this control method. This control method is cost effective as large areas can be readily treated. The chains or cables also scarify the soil surface in anticipation of seeding desirable species. The disadvantage is that weedy herbaceous vegetation can survive this treatment.

There are various tractor attachments that are used for mowing, beating, crushing, chopping, or shredding vegetation depending on the nature of the plant stand and goals of the project. The advantage in using this type of equipment is that selective plants may be targeted to achieve specific goals. For example, mowing is effective in reducing plant height to a desirable condition and it usually does not kill vegetation. Mowing is more effective on herbaceous than woody vegetation. On the other hand, a rolling cutter can kill woody non-sprouting vegetation by breaking stems at ground level but leave herbaceous vegetation. Mowing, beating, crushing, chopping, or shredding usually does not disturb soil. Rocky soil and steep slopes may limit this use of this equipment.

Debris management after a mechanical control treatment application is critical in fuels reduction projects. Vegetation material that is left on-site will dry and may become more hazardous than before the treatment. Herbaceous material is usually not a problem because it will decompose relatively fast depending on soil moisture, and ambient humidity and temperature. Woody vegetation should be piled and burned under acceptable fire management practices.

Biological

Biological methods of vegetation treatment employ living organisms to selectively suppress, inhibit, or control herbaceous and woody vegetation. This method is viewed as one of the more natural processes because it requires the proper management and plant-eating organisms and precludes the use of mechanical devices, chemical treatments, or burning of undesired vegetation.

The use of biological control agents will be conducted in accordance with BLM procedures in the Use of Biological Control Agents of Pests on Public Lands (BLM 1990). Insects, pathogens, and grazing by cattle, sheep or goats would be used as biological control methods under all alternatives, although at the present these methods can control few plant species. Insects are the main natural enemies being used at the present time. Other natural enemies include mites, nematodes and pathogens. This treatment method will not eradicate the target plant species but merely reduces the target plant densities to more tolerable levels. This method also reduces competition with the desired plant species for space, water and nutrients. This treatment method will be used on larger sites where the target plant has become established and is strongly competitive.

Gradually, biological methods using cattle, sheep, or goats would avoid erosion hazard areas, areas of compactable soils, riparian areas susceptible to bank damage, and steep erodible slopes.

Biological control using cattle, sheep or goats would be applied to treatment areas for short periods. When considering the use of grazing animals as an effective biological control measure, several factors will be taken into consideration including:

(1) Target plant species present,

(2) Size of the infestation of target plant species,

(3) Other plant species present,

(4) Stage of growth of both target and other plant species

(5) Palatability of all plant species present,

(6) Selectivity of all plant species present by the grazing animal species that is being considered for use as a biological control agent.

(7) The availability of that grazing animal within the treatment site area, and

(8) Type of management program that is logical and realistic for the specific treatment site.

These factors will be some of the options taken when developing the individual treatment for a specific site.

Although discussed as biological agents, cattle, sheep and goats are not truly biological agents but are domestic animals used to control only the top growth of certain noxious weeds. The following are some advantages of using domestic animals, mainly sheep or goats, for noxious weed control: (1) they use weeds as a food source, (2) following a brief adjustment period, they sometimes consume as much as 50 percent of their daily diet of this species, (3) average daily gains of offspring grazing certain weed-infested pastures can sometimes be significantly higher than average daily gains of offspring grazing grass pastures, and (4) sheep or goats can be used in combination with herbicides.

Some of the disadvantages of using domestic animals are (1) they also use nontarget plants as food sources, (2) the use of domestic animals, like sheep or goats, requires a herder or temporary fencing, (3) the animals may be killed by predators such as coyotes, (4) heavy grazing of some weed species, such as leafy spurge, tends to loosen the stool of the grazing animals, (5) most weed species are less palatable than desirable vegetation and would cause overgrazing, (6) they may accelerate movement of nonnative plants through seed ingestion and excretion, and (7) domestic livestock may transmit parasites and/or pathogens to resident native wildlife species.

Particular insects, pathogens or combinations of these biological control agents may also be introduced into an area of competing or undesired vegetation to selectively feed upon or infect those target plants and eventually reduce their density within that area. Only on rare occasions will one specific biological control agent reduce the target plant density to the desired level of control. Therefore in most situations, a complex of biological control agents is needed to reduce the target plant density to a desirable level. But even with a complex of biological control agents, often 15 to 20 years are needed to bring about an economic control level, especially on creeping perennials. In most circumstances, biological control agents are not performing control. They are only creating stresses on the weeds, which is not the same as control.

Some of the advantages of using natural enemies to control weeds are that (1) they are self-perpetuating, (2) they can be comparatively economical once studied and established, (3) they can be highly selective, (4) they offer a high degree of environmental safety, and (5) they do not require fossil fuel energy.

Biological control, however, does have limitations because (1) it is a slow process, (2) it does not achieve eradication but merely reduced weed densities to more tolerable levels, (3) it is highly selective, attacking one weed existing among a complex of other weeds, (4) it cannot be used against weeds that are valued under some situation because insects or pathogens do not recognize boundaries, (5) it cannot be used against weeds that are closely related to beneficial plants because the insects or pathogens may be unable to discriminate between related plant species, and (6) it cannot be used against weeds when the biological control agent requires an alternate host that may be a beneficial plant.

To develop a biological weed control program, the following steps must be taken:

(1) Identify weed species and determine origin.

(2) Determine if any natural enemies occur at the point of origin.

(3) If possible, collect natural enemies.

(4) Hold preliminary screening trials on the natural enemies of the weed in the United States.

(5) Hold further screening trials in the United States.

(6) Raise biological control agents before first release.

(7) Release biological control agents for the first time onto selected sites.

(8) If biological control agents survive and increase in numbers, collect agents and release onto other sites of weed infestation.

Usually a complex of at least three to five different biological agents, such as insects, must be used to attack an individual weed infestation site. But even with a complex of biological agents, often 15 to 20 years are needed to bring about an economic control level, especially on creeping perennials.

Prescribed Burning

Prescribed burning is the planned application of fire to wildland fuels in their natural or modified state, under specific conditions of fuels, weather, and other variables, to allow the fire to remain in a predetermined area and to achieve site-specific fire and resource management objectives.

Management objectives of prescribed burning include the control of certain species; enhancement of growth, reproduction, or vigor of certain species, management of fuel loads, and maintenance of vegetation community types that best meet multiple-use management objectives. Treatments would be

implemented in accordance with BLM procedures in Fire Planning (BLM 1987c), Prescribed Fire Management (BLM 1988b), and Fire Training and Qualifications (BLM 1987d).

Prior to conducting a prescribed burn, a written plan must be prepared that takes into consideration existing conditions (amount of fuel, fuel moisture, temperatures, terrain, weather forecasts, etc.) And identifies people responsible for overseeing the fire. Natural fire that is allowed to burn also needs to be carefully monitored to ensure that it will not threaten communities, other values to be protected, and ecosystems. This may require special expertise such as the fire use management teams that have been developed to support the overall fire management program. Planning and implementation for a specific prescribed fire project entails the following four phases:

- Phase 1: Information/Assessment Phase includes identifying the area to be treated, inventory and assessment of site specific conditions (live and dead vegetation densities, dead down woody fuels loadings, soil types, etc.), analysis of historic and present fire management, identification of resource objectives from Land Use Plans and NEPA analysis and compliance.
- Phase 2; The Prescribed Fire Plan Development Phase includes developing the site specific prescribed fire plan to BLM Standards, it also includes reviews of the plan and obtaining plan approval from local BLM field office administrators.
- Phase 3; Implementation includes ignition of the fire according to the plan's prescribed parameters. Implementation includes prescribed fire boundary area preparation to ensure the fire remains in prescribed boundaries. Site preparation may be in the form of fire line construction and improving roads, wildlife and stock trails by limbing trees and clearing debris.
- Phase 4; Monitoring and Evaluation includes assessment and long term monitoring of the fire treatment to ensure the prescribed fire has met the objectives of the approved prescribed fire plan.

Appropriate Management Response

The appropriate management response concept represents a range of available management responses to wildland fires. Responses range from full fire suppression to managing fires for resource benefits (fire use). Management responses applied to a fire will be identified in the FMP's and will be based on objectives derived from the area's Fire Management Category (A, B, C, or D categories); relative risk to resources, the public and fire fighters; potential complexity; and the ability to defend management boundaries. Any wildland fire can be aggressively suppressed and any fire that occurs in an area designated for fire use can be managed for resource benefits if it meets the prescribed criteria from an approved fire management plan.

Chemical

Chemical treatment would be utilized to control unwanted vegetation, and in some instances would be followed by a prescribed burn. Treatments would be conducted in accordance with BLM procedures in Chemical Pest Control (BLM 1988c). Treatments would meet or exceed individual States' label standards. The chemicals cam be applied by many different methods, and the selected technique depends on a number of variables. Some of these are (1) the treatment objective (removal or reduction); (2) the accessibility, topography, and size of the treatment area; (3) the characteristics of the target species and the desired vegetation; (4) the location of sensitive areas in the immediate vicinity (potential environmental impacts); (5) the anticipated costs and equipment limitations; and (6) the meteorological and vegetative conditions of the treatment area at the time of treatment.

Herbicide applications are scheduled and designed to minimize potential impacts on non-target plants and animals, while remaining consistent with the objective of the vegetation treatment program. The rates of application depend on the target species, presence and condition of non-target vegetation, soil type, depth to the water table, presence of other water sources, and the requirements of the label.

In many circumstances the herbicide chosen, time of treatment, and rate of application of the herbicide is different than the most ideal herbicide application for maximum control of the target plant species in order to minimize damage to the non-target plant species, and to ensure minimum risk to human health and safety.

The chemicals would be applied aerially with helicopters or fixed-wing aircraft or on the ground using vehicles or manual application devices. Helicopters are most expensive to use than fixed-wing aircraft, but they are more maneuverable and effective in areas with irregular terrain and in treating specific target vegetation in areas with many vegetation types. Manual applications are used only

for treating small areas or those inaccessible by vehicle.

The typical and maximum application rates of each chemical would vary, depending on the program area being treated.

Fire Suppression Actions

The following constraints to fire suppression actions are common to all alternatives:

- Suppression tactics will be utilized that limit damage or disturbance to the habitat and landscape. No heavy equipment will be used (such as dozers) unless approved the Field Office Manager.
- Use of fire retardants or chemicals adjacent to waterways will be accomplished in accordance to the "Environmental Guidelines For Delivery of Retardant or Foam Near Waterways (Interagency Standards for Fire and Aviation Operations pages 8-13)
- All known cultural resources will be protected from disturbance.
- In Wilderness Areas when suppression actions are required, minimum impact suppression tactics will be utilized and coordinated with Wilderness Area management objectives.
- The general and species-specific Conservation Measures listed in Appendix D will be implemented to the extent possible to minimize adverse effects to Federally listed, proposed, or candidate species occurring within the action area.

2.5 Implementation and Monitoring

2.5.1 Implementation

LUP decisions generally are implemented or become effective upon approval of the plan or amendment. These include the effective date of land health standards and desired future condition decisions, land use allocation decisions, and all special designations such as an ACEC. Management actions that require additional site-specific project planning as funding becomes available will require further environmental analysis. Decisions to implement site-specific projects are subject to administrative review at the time such decisions are made. BLM will continue to involve and collaborate with the public during implementation of the LUP amendment.

2.5.2 Adaptive Management

Adaptive management is a formal, systematic, and rigorous approach to learning from the outcomes of management actions, accommodating change and improving management. It involves synthesizing existing knowledge, exploring alternative actions and making explicit forecasts about their outcomes. Management actions and monitoring programs are carefully designed to generate reliable feedback and clarify the reasons underlying outcomes. Actions and objectives are then adjusted based on this feedback and improved understanding. In addition, decisions, actions and outcomes are carefully documented and communicated to others, so that knowledge gained through experience is passed on, rather than being lost when individuals move or leave the organization.

This LUP amendment implements an adaptive management strategy. This adaptive management process is a flexible process that generally involves four phases: planning, implementation, monitoring, and evaluation. As BLM obtains new information, it would evaluate monitoring data and other resource information to periodically refine and update desired conditions and management strategies. This allows for the continual refinement and improvement of management prescriptions and practices.

2.5.3 Administrative Actions

Although BLM's intent and commitment to accomplish administrative actions is generally addressed in RMP/EIS or LUP amendment/EA level documents, such activities are neither land use plan level decisions nor implementation level management actions decisions. Administrative actions are day-to-day activities conducted by BLM, often required by FLPMA but do not require a NEPA analysis or decision by a responsible official to be accomplished. Examples of administrative actions include: mapping, surveying, inventorying, monitoring, collecting information needed such as research and studies, and completing project specific or implementation level plans. Administrative actions are denoted throughout the decision document with a number beginning with an "AA."

2.5.4 Requirements for Further Environmental Analysis

The LUP amendment/EA is a programmatic environmental document describing the impacts of implementing the LUP decision and associated management actions described in the planning areas on a statewide basis. LUP decisions that are

implemented upon approval of the amendment do not require any further environmental analysis or documentation. Whenever implementation level plans (e.g., Fire Management Plans, etc.) are prepared additional environmental analysis and documentation would be required. Individual management actions or projects requiring additional site-specific project planning as funding becomes available would require further environmental analysis.

Site-specific environmental analyses and documentation (including the use of categorical exclusions and determinations of NEPA adequacy where appropriate) may be prepared for one or more individual projects, in accordance with management objectives and decisions established in the approved land use plan. In addition, BLM will ensure that the environmental review process includes evaluation of all critical elements. Cultural resources and threatened and endangered species will be identified and considered in accordance with Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act, respectively.

Interdisciplinary impact analysis will be based on this and other applicable environmental documents. If the analysis prepared for site-specific projects finds potential for significant impacts not already described in an existing EA or EIS, another EA, EIS, or a supplement to an existing EIS may be warranted.

Upon providing public notice of a decision, supporting environmental documentation will be sent to all affected interests and made available to other publics on request. Decisions to implement site-specific projects are subject to administrative review at the time such decisions are made.

2.6 Interrelationships

The BLM coordinates its fire management activities with the actions of related Federal and State agencies responsible for fire management. The Federal Wildland Fire Policy is a collaborative effort that includes the BLM, U.S. Forest Service, National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), Bureau of Indian Affairs, the National Biological Service, and State wildfire management organizations. The collaborative effort has formulated and standardized the guiding principals and priorities of wildland fire management. Collaboration of the Federal Wildland Fire Policy on a nation wide scale has provided common priorities and objective for Federal land management agencies including protection of human life, property, and natural/cultural resources as secondary priorities. This policy also provides recognition of wildland fire as a critical natural process that should be safely reintroduced into ecosystems that are wildfire dependent across agency boundaries. The National Fire Plan is a collaborative interagency effort to apply the Federal Wildland Policy to all Federal Land Management Agencies and partners in State forestry or lands departments. Operational collaboration between the BLM, U.S. Forest Service, NPS, and USFWS is included in the Interagency Standards for Fire and Fire Aviation Operations 2003. This Federally approved document addresses fire management, wildfire suppression, fuels management and prescribed fire safety, interagency coordination and cooperation, qualifications and training, objectives, performance standards, and fire management program administration.

As part of the LUP amendment process, BLM conducted Endangered Species Act (ESA) Section 7 informal and formal consultation with the U.S. Fish and Wildlife Service (USFWS) on potential impacts to federally listed, proposed, and candidate species, and designated or proposed critical habitat. In April 2003, BLM and USFWS finalized a Consultation Agreement to establish an effective and cooperative ESA Section 7 consultation process. The Agreement defines the process, products, actions, schedule, and expectations of the BLM and USFWS regarding project consultation. The Agreement also considers effects to, and management for, candidate species. One Biological Evaluation (BE) was prepared to determine the effect of the preferred alternative on all relevant listed, proposed, and candidate species, and associated critical habitat. All anticipated environmental effects, conservation actions, mitigation, and monitoring were disclosed in the BE, including analysis of all direct and indirect effects of the LUP amendment and any interrelated and interdependent actions. The BE will be submitted to the USFWS in September 2003 and a BO is expected from the USFWS in about January 2004.

This EA also included consultation with the Arizona State Historic Preservation Office (SHPO) on compliance with Section 106 of the National Historic Preservation Act (NHPA). BLM actions will also comply with other Federal environmental legislation, existing programmatic fire management, land use plans, and vegetation treatment documents, such as the Clear Air Act, the Clean Water Act, and the Safe Drinking Water Act, and with applicable Sate and local government regulations, such as the Sikes Act (16 U.S.C. 670 et seq.), as amended (see Section 1.4 and Appendix B, “Applicable Laws, Regulations, Policies and Planning Criteria”).

The Sikes Act authorizes DOI, in cooperation with the State agencies responsible for the administration of fish and game laws, to plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish and game on public lands within its jurisdiction. The plans must be consistent with any overall land-use and management plans for the lands involved and could include specific habitat improvement projects and related activities and adequate protection for species of fish, wildlife, and plants considered endangered or threatened. BLM must also coordinate with appropriate State agencies in management of State-listed plant and animal species when a State has formally made such designations.